

LISTING OF THE CLAIMS

Claims 1-78 were originally pending. Please amend claims 1-76 and 78. Kindly cancel claim 77 without prejudice. No claims are added or withdrawn. Accordingly, claims 1-76 and 78 are currently pending.

The following listing of claims replaces all prior versions and listings of claims in the application.

1. (Currently amended) In a distributed computing environment, a computer-implemented method for ~~dynamically~~ implementing workflow responsive to a directory object state change, the method comprising:

automatically detecting a state change to an object in a directory; and

responsive to detecting the state change, automatically:

mapping the state change to the object to a workflow comprising a set of tasks; and

executing the tasks to achieve a desired state in the directory.

2. (Currently amended) A ~~The method as recited in~~ of claim 1, wherein executing the tasks further comprises storing the desired state.

3. (Currently amended) A ~~The method as recited in~~ of claim 1, wherein executing the tasks further comprises continuously executing an operation of a task of the tasks until convergence of the desired state is identified.

1 4. (Currently amended) A The method as recited in of claim 1, wherein
2 executing the tasks further comprises storing a sequence of operations based on
3 the tasks.

4
5 5. (Currently amended) A The method as recited in of claim 1, wherein
6 executing the tasks further comprises storing information corresponding to one or
7 more directory objects to which the workflow applies.

8
9 6. (Currently amended) A The method as recited in of claim 1, wherein
10 executing the tasks further comprises storing status information based on
11 respective status of at least one subset of the tasks.

12
13 7. (Currently amended) A The method as recited in of claim 1, wherein
14 mapping the state change to the object further comprises evaluating the state
15 change to the object based on a declarative condition stored as a text string on an
16 object instance of a content class defined by the directory schema.

17
18 8. (Currently amended) A The method as recited in of claim 1, wherein
19 a task of the tasks comprises any combination of a declarative condition or an
20 operation that is stored as a text string on an object instance of a content class
21 defined by the directory schema.

22
23 9. (Currently amended) A The method as recited in of claim 1, wherein
24 semantics of the workflow are based on a workflow schema.
25

1 10. (Currently amended) A The method ~~as recited in~~ of claim 1, wherein
2 mapping the state change to the object, semantics of the mapping are based on an
3 event association object schema.

4
5 11. (Currently amended) A The method ~~as recited in~~ of claim 1, wherein
6 executing the tasks at least one subset of the tasks are executed with respect to one
7 another based on an order of execution relationship comprising a finish-start
8 relationship, a parallel execution relationship, a precedence constraint relationship,
9 or a task priority relationship.

10
11 12. (Currently amended) A The method ~~as recited in~~ of claim 1, wherein
12 executing the tasks at least one subset of the tasks is executed with respect to one
13 another based on a precedence constraint relationship or a task priority
14 relationship.

15
16 13. (Currently amended) A The method ~~as recited in~~ of claim 1, wherein
17 the method further comprises:

18 monitoring a status corresponding to a task of the tasks;

19 storing the status on a status monitoring object; and

20 wherein a content class in the directory schema defines the status-
21 monitoring object.

22
23 14. (Currently amended) A The method ~~as recited in~~ of claim 1, wherein
24 the method further comprises:

25 monitoring a set of directory resources affected by the workflow;

1 storing the directory resources on a status monitoring object; and
2 wherein a content class in the directory schema defines the status-
3 monitoring object.

4
5 15. (Currently amended) A The method as recited in of claim 1, wherein
6 the method further comprises:

7 monitoring a status corresponding to an operation of the workflow;
8 determining that the status comprises a failure status;
9 responsive to the determining, taking a corrective action to advance the
10 workflow in view of the failure status; and

11 wherein a content class in the directory schema defines the status-
12 monitoring object.

13
14 16. (Currently amended) A The method as recited in of claim 1, wherein
15 executing the tasks further comprises:

16 updating a status corresponding to a task in the workflow; and
17 responsive to the updating, evaluating the workflow to determine that a
18 next task of the tasks to be implemented.

19
20 17. (Currently amended) A The method as recited in of claim 1, wherein
21 the tasks represent an inverse set of tasks that were previously performed as part of
22 a different workflow.

23
24 18. (Currently amended) A The method as recited in of claim 1, wherein
25 the tasks implement a policy with respect to one or more directory resources, and

1 wherein mapping the state change to the object further comprises automatically
2 determining the workflow based on the policy.

3
4 19. (Currently amended) A computer-readable medium comprising
5 computer-executable instructions for ~~dynamically implementing to implement~~
6 workflow responsive to a directory object state change, the computer-executable
7 instructions comprising instructions for:

8 detecting a state change to an object in a directory; and

9 responsive to detecting the state change:

10 mapping the state change to the object to a workflow comprising a
11 set of tasks; and

12 executing the tasks to achieve a desired state in the directory.

13
14 20. (Currently amended) A The computer-readable medium ~~as recited in~~
15 of claim 19, wherein the instructions for executing the tasks further comprise
16 instructions for storing the desired state.

17
18 21. (Currently amended) A The computer-readable medium ~~as recited in~~
19 of claim 19, wherein the instructions for executing the tasks further comprise
20 instructions for continuously executing an operation of a task of the tasks until
21 convergence of the desired state is identified.

22
23 22. (Currently amended) A The computer-readable medium ~~as recited in~~
24 of claim 19, wherein the instructions for executing the tasks further comprise
25 instructions for storing a sequence of operations based on the tasks.

1
2 23. (Currently amended) A The computer-readable medium ~~as recited in~~
3 of claim 19, wherein instructions for executing the tasks further comprise
4 instructions for storing information corresponding to one or more directory objects
5 to which the workflow applies.

6
7 24. (Currently amended) A The computer-readable medium ~~as recited in~~
8 of claim 19, wherein the instructions for executing the tasks further comprise
9 instructions for storing status information based on respective status of at least one
10 subset of the tasks.

11
12 25. (Currently amended) A The computer-readable medium ~~as recited in~~
13 of claim 19, wherein the instructions for mapping the state change to the object
14 further comprise instructions for evaluating the state change to the object based on
15 a declarative condition stored as a text string on an object instance of a content
16 class defined by ~~the~~ a directory schema.

17
18 26. (Currently amended) A The computer-readable medium ~~as recited in~~
19 of claim 19, wherein a task of the tasks comprises any combination of declarative
20 conditions and operations that are stored as a text string on an object instance of a
21 content class defined by ~~the~~ a directory schema.

22
23 27. (Currently amended) A The computer-readable medium ~~as recited in~~
24 of claim 19, wherein semantics of the workflow are based on a workflow schema.
25

1 28. (Currently amended) A The computer-readable medium ~~as recited in~~
2 of claim 19, wherein the instructions for mapping the state change to the object,
3 semantics of the mapping are based on an event association object schema.

4
5 29. (Currently amended) A The computer-readable medium ~~as recited in~~
6 of claim 19, wherein the instructions for executing the tasks, at least one subset of
7 the tasks are executed with respect to one another based on an order of execution
8 relationship comprising a finish-start relationship, a parallel execution
9 relationship, a precedence constraint relationship, or a task priority relationship.

10
11 30. (Currently amended) A The computer-readable medium ~~as recited in~~
12 of claim 19, wherein the instructions for executing the tasks, at least one subset of
13 the tasks are executed with respect to one another based on a precedence
14 constraint relationship or a task priority relationship.

15
16 31. (Currently amended) A The computer-readable medium ~~as recited in~~
17 of claim 19, wherein the computer-executable instructions further comprise
18 instructions for:

19 automatically:

20 monitoring a status corresponding to a task of the tasks; and

21 storing the status on a status monitoring object; and

22 wherein a content class in the directory schema defines the status-
23 monitoring object.

1 32. (Currently amended) A The computer-readable medium as recited in
2 of claim 19, wherein the computer-executable instructions further comprise
3 instructions for:

4 automatically:

5 monitoring a set of directory resources affected by the workflow;

6 and

7 storing the directory resources on a status monitoring object; and

8 wherein a content class in the directory schema defines the status-
9 monitoring object.

10
11 33. (Currently amended) A The computer-readable medium as recited in
12 of claim 19, wherein the computer-executable instructions further comprises
13 instructions for automated operations for:

14 monitoring, by a status-monitoring object defined by a content class in the
15 directory schema, a status corresponding to an operation of the workflow;

16 determining that the status comprises a failure status;

17 responsive to the determining, taking a corrective action to advance the
18 workflow in view of the failure status; and

19 ~~wherein a content class in the directory schema defines the status-~~
20 ~~monitoring object.~~

21
22 34. (Currently amended) A The computer-readable medium as recited in
23 of claim 19, wherein the instructions for executing the tasks further comprise
24 instructions for:

25 updating a status corresponding to a task in the workflow; and

1 responsive to the updating, evaluating the workflow to determine that a
2 next task of the tasks to be implemented.

3
4 35. (Currently amended) A The computer-readable medium ~~as recited in~~
5 of claim 19, wherein the tasks represent an inverse set of tasks that were previously
6 performed as part of a different workflow.

7
8 36. (Currently amended) A The computer-readable medium ~~as recited in~~
9 of claim 19, wherein the tasks implement a policy with respect to one or more
10 directory resources, and wherein the instructions for mapping the state change to
11 the object further comprises instructions for automatically determining the
12 workflow based on the policy.

13
14 37. (Currently amended) A computing device comprising:
15 a memory comprising computer-executable instructions for ~~dynamically~~
16 automatically implementing workflow responsive to a directory object state
17 change; and

18 a processor coupled to the memory for executing the computer-executable
19 instructions, the computer-executable instructions comprising instructions for:

20 detecting a state change to an object in a directory; and
21 responsive to detecting the state change:
22 mapping the state change to the object to a workflow comprising a
23 set of tasks; and
24 executing the tasks to achieve a desired state in the directory.
25

1 38. (Currently amended) A The computing device as ~~recited in~~ of claim
2 37, wherein the instructions for executing the tasks further comprise instructions
3 for storing the desired state.

4
5 39. (Currently amended) A The computing device as ~~recited in~~ of claim
6 37, wherein the instructions for executing the tasks further comprise instructions
7 for continuously executing an operation of a task of the tasks until convergence of
8 the desired state is identified.

9
10 40. (Currently amended) A The computing device as ~~recited in~~ of claim
11 37, wherein the instructions for executing the tasks further comprise instructions
12 for storing a sequence of operations based on the tasks.

13
14 41. (Currently amended) A The computing device as ~~recited in~~ of claim
15 37, wherein instructions for executing the tasks further comprise instructions for
16 storing information corresponding to one or more directory objects to which the
17 workflow applies.

18
19 42. (Currently amended) A The computing device as ~~recited in~~ of claim
20 37, wherein the instructions for executing the tasks further comprise instructions
21 for storing status information based on respective status of at least one subset of
22 the tasks.

23
24 43. (Currently amended) A The computing device as ~~recited in~~ of claim
25 37, wherein the instructions for mapping the state change to the object further

1 comprise instructions for evaluating the state change to the object based on a
2 declarative condition stored as a text string on an object instance of a content class
3 defined by the directory schema.
4

5 44. (Currently amended) A The computing device ~~as recited in~~ of claim
6 37, wherein a task of the tasks comprises any combination of one or more
7 declarative conditions and one or more operations represented by a text string
8 stored on an object instance of a content class defined by the directory schema.
9

10 45. (Currently amended) A The computing device ~~as recited in~~ of claim
11 37, wherein semantics of the workflow are based on a workflow schema.
12

13 46. (Currently amended) A The computing device ~~as recited in~~ of claim
14 37, wherein the instructions for mapping the state change to the object, semantics
15 of the mapping are based on an event association object schema.
16

17 47. (Currently amended) A The computing device ~~as recited in~~ of claim 37,
18 wherein the instructions for executing the tasks, at least one subset of the tasks are
19 executed with respect to one another based on an order of execution relationship
20 comprising a finish-start relationship, a parallel execution relationship, a
21 precedence constraint relationship, or a task priority relationship.
22

23 48. (Currently amended) A The computing device ~~as recited in~~ of claim
24 37, wherein the instructions for executing the tasks, at least one subset of the tasks
25

1 are executed with respect to one another based on a precedence constraint
2 relationship or a task priority relationship.

3
4 49. (Currently amended) A The computing device ~~as recited in~~ of claim
5 37, wherein the computer-executable instructions further comprise instructions
6 for:

7 monitoring a status corresponding to a task of the tasks;
8 storing the status on a status monitoring object; and
9 wherein a content class in the directory schema defines the status-
10 monitoring object.

11
12 50. (Currently amended) A The computing device ~~as recited in~~ of claim
13 37, wherein the computer-executable instructions further comprise instructions
14 for:

15 monitoring a set of directory resources affected by the workflow;
16 storing the directory resources on a status monitoring object; and
17 wherein a content class in the directory schema defines the status-
18 monitoring object.

19
20 51. (Currently amended) A The computing device ~~as recited in~~ of claim
21 37, wherein the computer-executable instructions further comprises instructions
22 for:

23 monitoring a status corresponding to an operation of the workflow;
24 determining that the status comprises a failure status;
25

1 responsive to the determining, taking a corrective action to advance the
2 workflow in view of the failure status; and

3 wherein a content class in the directory schema defines the status-
4 monitoring object.

5
6 52. (Currently amended) A The computing device ~~as recited in~~ of claim
7 37, wherein the instructions for executing the tasks further comprise instructions
8 for:

9 updating a status corresponding to a task in the workflow; and
10 responsive to the updating, evaluating the workflow to determine that a
11 next task of the tasks to be implemented.

12
13 53. (Currently amended) A The computing device ~~as recited in~~ of claim
14 37, wherein the tasks represent an inverse set of tasks that were previously
15 performed as part of a different workflow.

16
17 54. (Currently amended) A The computing device ~~as recited in~~ of 37,
18 wherein the tasks implement a policy with respect to one or more directory
19 resources, and wherein the instructions for mapping the state change to the object
20 further comprises instructions for automatically determining the workflow based
21 on the policy.

22
23 55. (Currently amended) A computing device comprising automated
24 processing means for:

25 detecting a state change to an object in a directory; and

responsive to detecting the state change:

mapping the state change to the object to a workflow comprising a set of tasks; and

executing the tasks to achieve a desired state in the directory.

56. (Currently amended) A computing device as ~~recited in~~ of claim 55, wherein the means for executing the tasks further comprise means for storing the desired state.

57. (Currently amended) A computing device as ~~recited in~~ of claim 55, wherein the means for executing the tasks further comprise means for continuously executing an operation of a task of the tasks until convergence of the desired state is identified.

58. (Currently amended) A computing device as ~~recited in~~ of claim 55, wherein the means for executing the tasks further comprise means for storing a sequence of operations based on the tasks.

59. (Currently amended) A computing device as ~~recited in~~ of claim 55, wherein means for executing the tasks further comprise means for storing information corresponding to one or more directory objects to which the workflow applies.

1 60. (Currently amended) A computing device ~~as recited in~~ of claim 55,
2 wherein the means for executing the tasks further comprise means for storing
3 status information based on respective status of at least one subset of the tasks.
4

5 61. (Currently amended) A computing device ~~as recited in~~ of claim 55,
6 wherein the means for mapping the state change to the object further comprise
7 means for evaluating the state change to the object based on a declarative
8 condition stored as a text string on an object instance of a content class defined by
9 the directory schema.
10

11 62. (Currently amended) A computing device ~~as recited in~~ of claim 55,
12 wherein a task of the tasks comprises any combination of one or more declarative
13 conditions and one or more operations represented by a text string stored on an
14 object instance of a content class defined by the directory schema.
15

16 63. (Currently amended) A computing device ~~as recited in~~ of claim 55,
17 wherein semantics of the workflow are based on a workflow schema.
18

19 64. (Currently amended) A computing device ~~as recited in~~ of claim 55,
20 wherein the means for mapping the state change to the object, semantics of the
21 mapping are based on an event association object schema.
22

23 65. (Currently amended) A computing device ~~as recited in~~ of claim 55,
24 wherein the means for executing the tasks, at least one subset of the tasks are
25 executed with respect to one another based on an order of execution relationship

1 comprising a finish-start relationship, a parallel execution relationship, a
2 precedence constraint relationship, or a task priority relationship.

3
4 66. (Currently amended) A computing device as ~~recited in~~ of claim 55,
5 wherein the means for executing the tasks, at least one subset of the tasks are
6 executed with respect to one another based on a precedence constraint relationship
7 or a task priority relationship.

8
9 67. (Currently amended) A computing device as ~~recited in~~ of claim 55,
10 further comprising processing means for:

11 monitoring a status corresponding to a task of the tasks;

12 storing the status on a status monitoring object; and

13 wherein a content class in the directory schema defines the status-
14 monitoring object.

15
16 68. (Currently amended) A computing device as ~~recited in~~ of claim 55,
17 further comprising automated processing means for:

18 monitoring a set of directory resources affected by the workflow;

19 storing the directory resources on a status monitoring object; and

20 wherein a content class in the directory schema defines the status-
21 monitoring object.

22
23 69. (Currently amended) A computing device as ~~recited in~~ of claim 55,
24 further comprising automated processing means for:

25 monitoring a status corresponding to an operation of the workflow;

1 determining that the status comprises a failure status;
2 responsive to the determining, taking a corrective action to advance the
3 workflow in view of the failure status; and
4 ~~wherein a content class in the directory schema defines the status-~~
5 ~~monitoring object.~~

6
7 70. (Currently amended) A computing device ~~as recited in~~ of claim 55,
8 wherein the automated processing means for executing the tasks further comprise
9 means for:

10 updating a status corresponding to a task in the workflow; and
11 responsive to the updating, evaluating the workflow to determine that a
12 next task of the tasks to be implemented.

13
14 71. (Currently amended) A computing device ~~as recited in~~ of claim 55,
15 wherein the tasks represent an inverse set of tasks that were previously performed
16 as part of a different workflow.

17
18 72. (Currently amended) A computing device ~~as recited in~~ of claim 55,
19 wherein the tasks implement a policy with respect to one or more directory
20 resources, and wherein the means for mapping the state change to the object
21 further comprise means for automatically determining the workflow based on the
22 policy.

23
24 73. (Currently amended) A computer-readable medium comprising
25 workflow enabled directory schema for automated workflow implementation by a

1 set of computer-program instructions executable by a processor, the workflow
2 enable directory schema comprising a plurality of base object content classes, the
3 workflow enabled directory schema comprising:

4 a provisioning service content class to detect an event corresponding to a
5 state change in a directory object;

6 a workflow content class for storing a sequence of tasks;

7 an event association content class for storing declarative conditions to map
8 the state change to the directory object to an object instance of the workflow
9 content class; and

10 wherein the provisioning service content class is further configured to
11 execute the sequence of tasks corresponding to the object instance.

12
13 74. (Currently amended) ~~A workflow enabled directory schema as~~
14 ~~recited in~~ The computer-readable medium of claim 73, wherein at least a subset of
15 the base object content classes comprise a respective flexible attribute data field
16 that indicates a data type, the data type being used to express various operational
17 or data providing properties of the flexible attribute, the various operational or
18 data providing properties being independent of the data type and independent of
19 any modification to the workflow enabled directory schema.

20
21 75. (Currently amended) ~~A workflow enabled directory schema as~~
22 ~~recited in~~ The computer-readable medium of claim 73, wherein the sequence of
23 tasks comprises any combination of a declarative conditions and operations
24 corresponding to directory-based objects.

1 76. (Currently amended) ~~A workflow-enabled directory schema as~~
2 ~~recited in~~ The computer-readable medium of claim 73, further comprising a status
3 monitoring content class for storing a status of an object instance of the workflow
4 content class.

5
6 77. (Canceled)

7
8 78. (Original) A computer comprising the processor coupled to a
9 memory comprising the ~~a computer-readable medium of comprising a workflow~~
10 ~~enabled directory schema as recited in claim 73.~~
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